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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/760,139	01/16/2004	Eric B. Cummings	33532/US	7218

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EXAMINER

VATHYAM, SUREKHA

ART UNIT PAPER NUMBER

1753

DATE MAILED: 11/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

8

Office Action Summary	Application No. 10/760,139	Applicant(s) CUMMINGS ET AL.	
	Examiner Surekha Vathyam	Art Unit 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 January 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>06/07/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: "15" in Fig. 1 and "200" in Fig. 3.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "20" has been used to designate both outlet (last line of [022]) and center (2nd line of [023]).
3. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The abstract of the disclosure is objected to because it contains "SF_1128135". Correction is required. See MPEP § 608.01(b).

5. The disclosure is objected to because of the following informalities: the term "insulting" is used in lines 14, 16 and 27 of [019] instead of "insulating".

Appropriate correction is required.

6. The disclosure is objected to because of the following informalities: it is unclear what is meant by "exerts generates" on line 3 of [020].

Appropriate correction is required.

7. The disclosure is objected to because of the following informalities: line 11 of [020] should be corrected to read "outer and inner" instead of "outer an inner".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 10 – 11 and 14 – 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. Claim 10 recites the limitation "the ridges" in line 2. There is insufficient antecedent basis for this limitation in the claim.

11. Claim 14 recites the limitation "the non-uniform array" in line 3 and line 6. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

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12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. NOTE: While it is unclear what is being claimed, as discussed above, the claims have been considered with regard to the prior art to the extent possible.

14. Claims 1 – 6, 8 – 11 and 14 – 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Austin et al. (US 6,824,664).

Regarding claim 1, Austin ('664) discloses a device comprising: a substrate (14); a non-uniform array of insulating features on the substrate (see Figs. 8 and 9 and column 17, line 52 – column 18, line 47); and a plurality of electrodes (28a, 28b) positioned to generate a spatially non-uniform electric field across the non-uniform array (see Fig. 1D and column 8, lines 22 – 34).

Regarding claim 2, Austin ('664) discloses the device wherein the insulating features vary in size across at least a portion of the substrate (see Figs. 8 and 9, column 7, lines 39 – 43 and column 8, lines 28 – 32).

Regarding claim 3, Austin ('664) discloses the device wherein the insulating features vary in shape across at least a portion of the substrate (see Figs. 8 and 9, column 7, lines 26 – 31 and column 8, lines 28 – 32).

Regarding claim 4, Austin ('664) discloses the device wherein spacing between adjacent features in the array varies across at least a portion of the substrate (column 7, lines 43 – 49 and column 8, lines 28 – 32).

Regarding claim 5, Austin ('664) discloses the device wherein the insulating features are formed on a wall of a channel or chamber (column 12, lines 5 – 26).

Regarding claim 6, Austin ('664) discloses the device wherein the substrate comprises glass or polymer (column 5, lines 37 – 44).

Regarding claim 8, Austin ('664) discloses the device further comprising a voltage source (25) connected to the plurality of electrodes (column 7, line 66 – column 8, line 20).

Regarding claim 9, Austin ('664) discloses the device further comprising a fluid port (22 and 30) connected to the channel or chamber (column 10, lines 37 – 49).

Regarding claim 10, “the manner or method in which such machine is to be utilized is not germane to the issue of patentability of the machine itself” *In re Cassey*, 152 USPQ 235 (CCPA 1967), and “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Nonetheless, Austin ('664) discloses the device wherein the spatially non-uniform electric field generated across the array exerts a dielectrophoretic force on at least one of said particles (see Figs. 3A – 3D and column 12, line 40 – column 13, line 18).

Regarding claim 11, Austin ('664) discloses the device wherein said particles comprise particles selected from the group consisting of bacteria, cells and viruses (column 11, lines 13 – 35).

Regarding claim 14, Austin ('664) discloses a method for manipulating particles using dielectrophoresis (column 4, lines 43 – 55), the method comprising: generating a spatially non-uniform electric field (column 18, lines 7 – 10); passing a sample fluid containing the particles across a non-uniform array (column 17, lines 30 – 33 and column 18, lines 1 – 6), the spatially non-uniform electric field exerting a dielectrophoretic force on the particles thereby constraining motion of at least one particle (column 17, lines 32 – 38); and trapping at least one particle at a location in the non-uniform array (column 17, lines 38 – 48), wherein the location is determined at least in part based on electric and geometrical properties of the particle (column 18, lines 11 – 18).

Regarding claim 15, Austin ('664) discloses the method further comprises trapping a first group of particles having a first dielectrophoretic mobility at a first location in the non-uniform array and a second group of particles having a second dielectrophoretic mobility at a second location in the non-uniform array (column 17, lines 52 – 62).

Regarding claim 16, Austin ('664) discloses the method wherein the act of passing the sample fluid across the non-uniform array comprises electrokinetic

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transport, advection, sedimentation, buoyancy, or magnetophoresis (column 10, lines 37 – 49).

Regarding claim 17, Austin ('664) discloses the method further comprising changing the spatially non-uniform electric field such that the dielectrophoretic force on the first particle is decreased; and transporting the first particle to a second location in the non-uniform array; and trapping the first particle at the second location (column 17, lines 38 – 48 and column 18, lines 7 – 47).

Regarding claim 18, Austin ('664) discloses the method further comprising: changing the spatially non-uniform electric field such that the dielectrophoretic force on the first particle is decreased; and transporting the first particle to an outlet port (column 17, lines 38 – 48).

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

17. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

18. Claims 7, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Austin et al. (US 6,824,664) in view of Christel et al. (US 6,368,871).

Austin ('664) discloses a device as discussed with regards to claim 1 above.

Regarding claim 7, Austin ('664) discloses the device wherein the insulating features comprise an insulating material supported by an insulating material (column 5, lines 37 – 44 and column 11, line 36 – column 12, line 26) and does not explicitly disclose the supporting material being non-insulating.

Christel ('871) teaches insulating features comprising an insulating material supported by a non-insulating material (column 7, lines 49 – 54).

It would have been obvious to one of ordinary skill in the art to have modified the device of Austin ('664) to include the non-insulating material taught by Christel ('871) to support the insulating material of Austin ('664) because Christel ('871) explains that it

helps create a capacitance structure with a surface that is non-conductive and therefore can be used for the extraction, purification and concentration of nucleic acids from a complex biological sample (column 7, lines 53 – 57).

Regarding claim 12, Austin ('664) does not explicitly disclose the non-uniform array is a radial array.

Christel ('871) teaches a radial non-uniform array (see Fig. 8 and column 7, lines 37 – 49).

It would have been obvious to one skilled in the art to have modified the device of Austin ('664) to make the non-uniform array be a radial array as taught by Christel ('871) because as Christel ('871) explains the size and shape of the array and structures in the array are optimized to be consistent with the objective of efficient interaction with target moieties in the fluid sample (column 7, lines 12 – 16).

Regarding claim 13, Austin ('664) further discloses the device wherein the insulating features comprise posts (column 7, lines 26 – 30 and lines 39 – 43 and column 8, lines 28 – 34), and the cross-section of the posts increases as the distance from the point of sample input increases (see Figs. 8 and 9 and column 17, line 52 – column 18, line 47).

Double Patenting

19. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the

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unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

20. Claims 1, 3, 5, 9 and 10 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 3 – 7, 14, 16 – 17, 19 – 22 of U.S. Patent No. 7,014,747 in view of Austin et al. (US 6,824,664). Specifically, instant claim 1 is rejected as unpatentable over each of dependent claims 4, 17, 20 and 22. Instant claim 3 is rejected as unpatentable over each of claims 5 – 7, instant claim 5 over each of claims 1, 14, 19 and 21, instant claim 9 over each of claims 1, 14, 19 and 21 and instant claim 10 over each of claims 1, 14, 19 and 21. A one-way test for obviousness-type double patenting has been applied, as the application for US patent No. 7,014,747 was filed earlier than the instant application.

Regarding instant claim 1, dependent claims 4, 17, 20 and 22 of US patent No. 7,014,747 each recite all the limitations except for the explicit disclosure of non-uniform arrays.

Austin ('664) teaches non-uniform arrays of insulating features (see Figs. 8 and 9 and column 17, line 52 – column 18, line 47).

It would have been obvious to one of ordinary skill in the art to have modified the device of US patent No. 7,014,747 to include non-uniform arrays of insulating features as taught by Austin ('664) because it helps trap different lengths of DNA at different parts of the array based on different sizes of DNA in a sample as explained by Austin (column 17, line 29 – column 18, line 47).

21. Claims 6 and 14 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 4 and 5 of copending Application No. 10/176,322 in view of Austin et al. (US 6,824,664). Specifically instant claim 6 is rejected over each of dependent claims 4 and 5 and instant claim 14 is rejected over claim 1.

Regarding claim 14, claim 1 of Application No. 10/176,322 discloses all the limitations of the method recited in the instant claim except for the explicit disclosure of non-uniform arrays.

Austin ('664) teaches non-uniform arrays of insulating features (see Figs. 8 and 9 and column 17, line 52 – column 18, line 47).

It would have been obvious to one of ordinary skill in the art to have modified the device of Application No. 10/176,322 to include non-uniform arrays of insulating features as taught by Austin ('664) because it helps trap different lengths of DNA at

different parts of the array based on different sizes of DNA in a sample as explained by Austin (column 17, line 29 – column 18, line 47).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

22. Claims 1 –3 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 3 – 7 of copending Application No. 10/969137. Specifically, instant claim 1 is rejected as being unpatentable over dependent claim 3, instant claim 2 over claim 7 and instant claim 3 over each of claims 4 – 6. Although the conflicting claims are not identical, they are not patentably distinct from each other because the indicated claims of co-pending application No. 10/969137 include all the limitations of the corresponding indicated instant claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lopez et al. (US 6,685,841) disclose non-uniform insulating arrays.

Talary et al. (US 2004/0226819) disclose radial array.

Noca et al. (US 6,685,810) disclose sieving device.

Benecke et al. (US 5,454,472) disclose radial non-uniform electric field.

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Austin et al. (US 5,427,663) disclose insulating arrays.

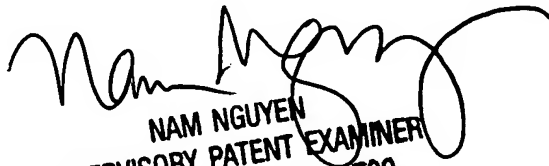
Becker et al. (US 6,641,708) disclose dielectrophoretic fractionation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Surekha Vathyam whose telephone number is 571-272-2682. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SV
November 17, 2006


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